Paying for Climate Change Adaptation in San Mateo County

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1. Executive Summary
San Mateo County (SMC) is projected to experience fifty-five inches of sea level rise by 2100, making it an alarming and potentially catastrophic threat to SMC if no preventative action is taken. The resulting flooding would directly affect hundreds of thousands of citizens in the Bay Area, and the damage caused to vital infrastructure such as roads, airports, hospitals, energy plants, schools, and more would cost over $20 billion to repair (not including the economic loss incurred from having that infrastructure out of commission for an extended period). Additionally, the damage to residential property is projected to reach almost $40 billion in the long term if no mitigation efforts are made.\(^1\)

While experts estimate that a dollar spent now on natural hazard mitigation on average saves society four dollars in the future in avoided damages, obtaining sufficient funding for such preventative efforts has proven difficult because the benefits of these projects are not immediately apparent. However, the ramifications of flooding due to sea level rise and stormwater runoff have already started to be felt in the Bay Area, as the Federal Emergency Management Agency (FEMA) has begun reclassifying flood risk areas and insurance requirements in vulnerable areas of San Mateo County (SMC).

Considering the pressing need to secure funds for climate change adaptation and risk mitigation projects, and the inherent challenges associated with obtaining these funds, the SMC Office of Sustainability engaged our team to identify potential funding and financing sources, and to prioritize their appropriateness for different types of sea level rise and stormwater adaptation projects.

Our team was asked to identify and evaluate funding options for projects within the County addressing two manifestations of climate change - sea level rise and extreme rainfall events. Separately, and in combination, they produce increased vulnerability to flooding, erosion, and increased water pollution.

We began our research by analyzing over fifty different options that in some way might be relevant to paying for climate adaptation strategies. We determined that a number of these options mainly applied to post-disaster situations, some no longer had money available, some overlapped with other options and others were just not sufficiently applicable. After this analysis, we narrowed down the list to the thirty options we have profiled in our Funding Compendium.

\(^1\) County of San Mateo Sea Level Rise Vulnerability Assessment
The table to the left shows how some of these options provide only “funding” and others the additional option of “financing.” Where there is a flow of funds over time, the money can be used as it comes in (“pay-as-you-go”) or it can be borrowed against, making available a larger up-front sum of money that has to be paid back from the future flows of funds. The latter choice represents the “financing” option.

To identify the funding/financing sources most suitable for different project types and stages, we developed a set of evaluation criteria to rank the relative appropriateness of options. Our framework rates the suitability of a funding/financing source for a particular project based on four key factors: (1) is the project eligible for the funding source, (2) if a grant, how likely is the project to be awarded it, (3) if other than a grant, how likely is the project to be approved by the relevant officials or voters, and (4) how significant is the amount of funding relative to project cost? We developed a formula for determining a high, medium or low relative score on each criterion. An overall rating is computed by averaging the likelihood of award rating (grant) or political feasibility rating (non-grant) with the amount rating. Secondarily we consider administrative feasibility, equity factors, and timing on an informal basis.

Given the number of project types for sea level rise protection and stormwater management, it was not feasible for our team to apply our evaluation framework to all project types. Consequently, to illustrate how project planners could apply our methodology to prioritize funding and financing sources, we chose three prototype projects that reflected the different types of projects that the County might pursue. We chose a Horizontal Levee and a Wetland Restoration project for sea level rise, and Green Streets for extreme rainfall. All three are considered “green” infrastructure with significant environmental co-benefits. We then applied the ratings framework to all our funding/financing options in relation to each of three project phases--planning, implementation, and operations & maintenance--for each of these three project types. After seeing in the report how we apply the criteria to these examples, project should be able to take the raw descriptive information in our Funding Compendium, which map directly into our criteria, and prioritize the different funding/financing sources for their particular projects.
The table to the left shows the results for the implementation phase ratings process for each of the three project types. Only options with medium or high overall scores for at least one of the three project types are included. The Horizontal Levee is a $50 million project, so the grant sources, usually provide a few million dollars at most, do not end up scoring very high as potential sources. Rather, the most suitable options are bond issues funded by different kinds of taxes, although none of these options are rated higher than medium because they require voter or property owner approval. Grants come into play as meaningful sources for the Wetlands Restoration and Green Streets projects because these are much smaller undertakings ($3 million and $1 million respectively), and there are several grant programs, particularly at the state level and regional level, which match with their green/multi-benefit character. There are also various local funding/financing sources which come into play for these two projects. Multiple sources of local transportation funds could be used for Green Streets, and a stormwater utility fee could help fund not only Green Streets but also Wetlands Restoration, as the latter helps filter pollution out of stormwater. If necessary, a locality could ask a neighborhood to vote for a benefit assessment for local Green Streets, or a community to authorize a parcel tax over a larger area to help fund Wetlands Restoration or Green Streets. Finally, while there are many competing demands on it, the General Fund is not infrequently tapped to help pay for small to medium size projects like those two types.

The funding sources which are prioritized (high or medium overall score) vary significantly by project phase. The are relatively fewer grant programs for project planning and virtually none for operations and maintenance. Local funding sources become more central for both phases, even for the larger, more expensive, horizontal levee project.

From reviewing the funding of many different projects and the characteristics and behavior of many different funding/financing sources, we also have arrived at some more general recommendations for project planners.

1. A project sponsor will usually have to package together many different sources to successfully complete a project.
2. Grant sources strongly favor green and multi-benefit projects.
3. In California at least, state and regional programs are a much better candidate for providing grant funding than federal sources, even though most of these programs rely on periodic ballot propositions to fund them.
4. Grant dollars tend to be more focused on the implementation phase, with less available for project planning and virtually nothing for operations & maintenance. This means that the project feasibility stage most frequently will be internally funded.
5. While there are many competing demands on it, the General Fund has played a role in most successful climate adaptation projects and will continue to do so for the foreseeable future.
6. While “typical” sources are by definition the most predictable, be opportunistic and creative, as in many instances atypical sources come into play.
7. Where we have rated balloted sources as appropriate for a moderate-sized project, we are assuming that the recommended funding/financing source would be developed in the context of creating a larger pool of money to fund multiple projects. Thus, it often makes sense to be thinking in terms of funding sources for a set of projects as opposed to a single project.

While we did not attempt to quantify the aggregate gap between the demand for project funding and available relevant grant and dedicated funding sources, it is significant, and we found widespread noting of the need for additional, dedicated funding. We make the following recommendations in terms of addressing this gap.

1. If it is upheld by the courts, SB 231 will enable counties and cities to introduce a stormwater fee without the 50% property owner approval currently required. Several cities around the state, including Burlingame and Palo Alto in our area, already have stormwater fees, authorized by property owner votes. If instituted in SMC’s unincorporated areas and all its cities, a stormwater fee on the level of Palo Alto at $13.65 per month per average residence would provide on the order of $54 million per year for operations & maintenance and $70 million per year for capital spending.
2. For multi-benefit projects directly adjoining the Bay, such as wetlands restoration and horizontal levees, the new San Francisco Bay Restoration Authority is a promising funding source compared to others we evaluated. However, the SFBRA has published a list of 129 already existing, theoretically eligible projects needing well over a billion dollars in funding, and it will only be providing a total of $25 million a year to between 5 and 10 projects. The SFBRA parcel tax is a relatively modest $12 per year, and it should be a targeted increase in the coming years.
3. Paying for larger climate adaptation projects typically involves some balloted source, so it is critical for policy makers and leaders to educate voters on potential co-benefits and cost avoidances resulting from such projects. Projects that receive significant community
approval are those that clearly outline co-benefits (benefits in addition to providing climate resilience) and cost avoidances (outlining how a specific project would save homeowners from, for example, heavy traffic or flooding). While SMC residents understand that climate change is occurring, they need to be more informed about the coming impacts on their communities and how prudent investments can minimize these costs.

2. Introduction
San Mateo County (SMC) is projected to experience fifty-five inches of sea level rise by 2100, making it an alarming and potentially catastrophic threat to SMC if no preventative action is taken. The resulting flooding would directly affect hundreds of thousands of citizens in the Bay Area, and the damage caused to vital infrastructure such as roads, airports, hospitals, energy plants, schools, and more would cost over $20 billion to repair (not including the economic loss incurred from having that infrastructure out of commission for an extended period of time). Additionally, the damage to residential property is projected to reach almost $40 billion in the long term if no mitigation efforts are made.²

While experts estimate that every dollar spent now on natural hazard mitigation, such as sea level rise mitigation and stormwater management, saves society four dollars in the future in terms of avoided damages, obtaining sufficient funding for such preventative efforts has proven difficult because the benefits of these projects are not immediately apparent.³ However, the ramifications of flooding due to sea level rise and stormwater runoff have already started to be felt in the Bay Area, as the Federal Emergency Management Agency (FEMA) has begun reclassifying flood risk areas and insurance requirements in vulnerable areas of SMC. In light of its pressing need to secure funds for climate change adaptation and risk mitigation projects, and the inherent challenges associated with obtaining these funds, the SMC Office of Sustainability engaged our team to identify potential funding and financing sources, and to prioritize their appropriateness for different types of sea level rise and stormwater adaptation projects.⁴

In the Methodology section of this report, we provide details on our background research and process for determining which funding and financing sources from our research could potentially be utilized by climate adaptation projects in SMC.

In the Adaptation Strategies of Interest section, we review the various sea level rise and extreme rainfall event adaptation strategies. We also discuss, at a high level, some potential project types

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² County of San Mateo Sea Level Rise Vulnerability Assessment
⁴ A financing source is a method for using a longer-term funding source to secure debt to pay for a project up front.
for each strategy. Further description and analysis of specific project types can be found later on in the report in the Selecting Prototype Projects and Prototype Project Description subsections of Section 7.0.

We provide an overview of the sources SMC could use to pay for a climate change adaptation project in the Funding/Financing Categories section. One of the main deliverables produced by our research for use by county and city project planners is SMC is a Funding Compendium, with detailed descriptive information on approximately thirty different funding/financing sources. This Compendium can be found in Appendix C.

A second major deliverable of the project is a framework for evaluating and prioritizing funding/financing sources for different types of sea level rise protection and stormwater management projects. An in-depth review and explanation of this framework can be found in the Funding/Financing Evaluation Criteria section.

We selected three important project types and identified the funding/financing sources that are most suitable at each stage (planning, implementation, and operations & management) for each project type based on our evaluation criteria. This ratings exercise is described in the Rating Funding/Financing Sources for Three Prototype Projects Types. Our third major deliverable, our recommendations for what funding sources are relatively attractive for these project types and phases, can be found in Appendix B. At the request of our client, we also applied the framework to two actual projects, Pescadero Integrated Flood Control and Plan Princeton Shoreline Management. This analysis is in Appendix A and the related recommendations for funding/financing sources in Appendix B.

In the Final Recommendations section, we share our suggestions for 1) what planners in the County should keep in mind as they put together sources to fund their projects and 2) what policy-makers in the County can do to increase the availability of funding.

3. Methodology
Our approach to this project progressed through four key phases. The first phase involved familiarizing ourselves with the challenges of sea-level rise and stormwater management, with specific attention to challenges for San Mateo County. We also learned about the kinds of projects that have been used to address these problems, as well as the funding/financing sources that have been used to pay for them. The client provided a myriad of background readings related to adaptation measures and their funding in the Bay Area, statewide and nationwide. As a supplement to these readings, we also conducted interviews with various stakeholders involved in projects of interest in the Bay Area. A full list of interviewees and the subject matter of their interviews can be found in Appendix E.
At the end of this phase we created the first draft of our Funding Compendium. This is an excel spreadsheet detailing all of the funding/financing sources that we were identifying as potential relevant along with key descriptors of each. We also drafted a preliminary set of criteria that would be useful when evaluating whether or not any given funding option is well-suited to any given project.

In the second phase, we narrowed our research focus to be specific to projects of interest to the San Mateo County client team using a combination of information from our interviews and online resources. We drafted a list of insights gleaned from actual climate adaptation projects carried out in San Mateo County. This not only gave us a deeper understanding of the project types most important to the county, but also helped us identify what enabled different projects to successfully pursue different funding/financing sources. Completion of this phase allowed us to develop a list of all project types that might be pursued by the County and its cities, as well as a list of funding/financing trends discovered from the research on successfully completed and in-process projects.

In our third phase we regrouped to compile all of our research and decide what further deliverables needed to be created in order to complete the project. We determined that the best way to communicate how to prioritize potential funding/financing sources for different climate adaptation projects would be to rate the sources for three representative project types using our evaluation criteria. We selected three projects typical for addressing sea-level rise and extreme rain events in SMC (green streets, horizontal levees, and wetland restoration) and finalized our list of evaluation criteria.

In the final phase of this project, we created our rating matrices based upon our final set of criteria and rated the options in our Funding Compendium for the three phases of each of the three project types. (The phases are planning, implementation and operations & maintenance.) This produced a total of nine rating matrices listing the most promising funding and financing sources for each project for the given phase.

We then also applied our rating methodology to the Pescadero Resiliency and Plan Princeton projects to compile appropriate funding/financing options. Lastly, we reflected on everything we had learned in the process of our research in terms of more general findings that might be helpful

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5 Appendix C
6 Appendix D
7 Appendix B
8 Appendix B
to County and city decision-makers. This exercise produced two sets of recommendations, one geared towards project developers and the other towards policy-makers.

4. Adaptation Strategies of Interest

Our team was asked to source and evaluate funding options for two manifestations of climate change - sea level rise and extreme rainfall events. Separately, and in combination, they produce increased vulnerability to flooding, erosion, and increased water pollution. In order to identify appropriate potential sources to pay for projects that deal with those problems, we first had to understand the relevant adaptation strategies and measures.

While there are numerous projects that address sea level rise and extreme rainfall, for purposes of our research, we focused on those found to be most currently relevant within San Mateo County. To deal with sea level rise, the County’s vulnerability report described three primary adaptation strategies: protection measures, accommodation measures, and retreat measures. Protection measures work to stop an area from becoming at-risk and can range from sea wall construction to wetlands restoration. Accommodation measures help to adapt assets in at-risk areas such that the risk is mitigated and the asset may continue to be utilized. These measures may include elevation of streets or increasing flood-proofing measures. Retreat measures are more clearly defined as the relocation of homes, businesses and/or infrastructure in areas in which protection or accommodation measures are not feasible for either timeline, geographic, or funding reasons. We focus on protection projects, as this report should be utilized prior to high-risk environmental changes. In our introductory meeting, the Office of Sustainability also expressed a particular interest in protection-oriented projects.

To manage stormwater produced by extreme rainfall, the two main adaptation strategies are diversion and infiltration. Diversion involves engineered channels and natural waterways to redirect polluted stormwater to avoid flooding. Meanwhile, infiltration involves measures which increase the amount of rainwater that goes into the soil and is captured there. In addition to reducing flooding, this keeps pollutants out of the bay and ocean, filters water naturally and boosts groundwater stocks, which ultimately could be used for drinking or irrigation.

Both diversion and infiltration projects are being used to deal with stormwater management and we consider financing for both kinds of measures to be of interest, although generally there is a preference for infiltration because of its potential co-benefits. The State has been heavily regulating the discharge of polluted stormwater into bodies of water, and the County is responsible for coordinating measures to meet these reduction requirements, with implementation by the County and cities. This stormwater discharge regulation has given rise to a number of projects and to new funding sources independent of the additional problem of climate change-driven extreme rain events.
In general, the County and cities are now taking an Integrated Water Management Approach to the overlapping problems of climate change--driven flooding and erosion, stormwater pollution, and drinking/irrigation water shortages. Projects that can address more than one problem are being prioritized by policymakers and funding sources. Co-beneficial or multi-beneficial projects are those which not only address the primary climate-change concern, but also provide additional benefits to the surrounding environment or community. An example could be utilizing green streets as a means to mitigate increased stormwater flooding as opposed to the construction of simple storm drains, which also reduces polluted runoff into the Bay, recharges groundwater and provides additional urban amenities.

5. Funding/Financing Categories
We began our research by analyzing over fifty different options that in some way might be relevant to paying for climate adaptation strategies. We determined that a number of these options mainly applied to post-disaster situations, some no longer having money available, some overlapped with other options and others were just not sufficiently applicable. After this analysis, we narrowed down the list to the approximately thirty options summarized in the table below and included in our Funding Compendium.

Some of these sources provide only “funding” and others the additional option of “financing.” Some funding sources, like a grant, provide money on a one-time basis, while others, like a tax, provide an ongoing flow of funds over some time period. Where there is a flow of funds, the money can be used as it comes in, which is referred to as “pay-as-you-go,” or it can be used to borrow against, making available a larger up-front sum of money that is paid back over time from the future flows of funds. The latter choice represents the “financing” option, and is usually accomplished by the county or city issuing bonds backed by the funding source.

Thus the methods we identified for paying for climate adaptation can be broken into two categories: pure funding sources and funding sources with financing options. The pure funding sources then break down into three sub-categories: funds from grants, local government funding sources without financing options and contributions from corporations or revenue-generating enterprises. Funds from grants are provided at the federal, state and regional levels of government. With grants, projects can apply for funding--usually in competition and one lump sum--which does not need to be paid back. Contributions can also come from private sources such as corporations (or their public enterprise counter-parts) and foundations. Local government funding sources without financing options are varied and include allocations from existing general fund monies, property related fees, development impact fees and relevant dedicated special revenues, such as the local portion of transportation funds.
Other local government funding sources like parcel taxes and special assessments produce a stream of revenue that will flow in over time and can be used either on a “pay-as-you-go” basis or can be borrowed against. Connected to these sources is a specific option to authorize the issuance of bonds at the same time that the tax or assessment is authorized. We refer to these as sources with a financing option. Use of the financing option can be particularly important in funding large construction expenditures.

For example, a Mello-Roos District can be created simply to levy new Mello-Roos taxes, or, the district can issue a Mello-Roos Bond by borrowing against future expected funding tax revenue from the district. General Obligation bonds are the one example where a dedicated funding source (additional ad valorem property taxes) can only be used in combination with financing. More specifically, a local jurisdiction cannot increase ad valorem property taxes without issuing general obligation bonds.

There are some financing sources other than issuing bonds that theoretically might be used, such as public-private partnerships, but their use for the project types relevant to this report have been rare. For one thing, interest paid on most bonds issued by counties and cities is not taxed by the federal government or the State of California, so the interest rate that has to be paid on these bonds is normally lower than the cost of other forms of financing.

Our analysis also identified some funding and financing innovations related to monetizing insurance-related financing: issuing catastrophe bonds with a “resilience component” and creating a community flood insurance option. These unique sources seem like promising possibilities in the future, but are not yet ready for usage. Resilience focused organizations should continue to observe these options as their research becomes more robust and their usage becomes more widespread. We discuss them further in a later section of the report.
6. Funding/Financing Evaluation Criteria for Rating System
By design, structure or history, different funding and financing options vary in important aspects, like what is required to authorize them or how much money they can provide. At the same time, different types of climate adaptation projects vary in aspects such as the geographic scope of their benefits and how much they cost. Moreover, even within a particular project type, there are vastly different stages of development, beginning with planning, moving to implementation and ending with operations & maintenance. In order to effectively identify which funding and financing options are most suitable for project types and stages, a set of evaluation criteria are necessary to rank the appropriateness of options relative to each other.

6.1 Core Criteria
These are the four criteria which we believe are most important to consider for all projects. As such, in addition to defining them, we designed a formal rating system for each.

- **Eligibility** describes whether or not the project meets the requirements to apply for a program or to qualify for funding by a particular type of tax, assessment or fee. Relevant factors include the required purposes of the program (type and stage of project), whether the project will be located in an eligible jurisdiction, required benefits of the project, and
anything else that the program or law specifies. Our rating is either “Likely” or “Not Likely,” which denotes whether or not the project type is likely or not likely to be eligible.

- **Likelihood of funding** applies to grant and similar sources, and indicates the the probability that the project will actually receive funds from the source. We assess this based on a) how the project might fare based on the disclosed scoring and preference factors of the source b) how competitive the program is based on the number of applications compared to the number of grantees approved. We first assign a ranking based on factor b), with scores of 1, 2 and 3 corresponding to low, medium and high. A “low” program historically awards less than 20% of applicants, a “medium” program awards between 20% and 49% of applicants, and a “high” program awards 50% or more of its applicants with a grant. However, some programs are new so there is no success rate history, some do not release all the necessary information, and programs sometimes change, rendering historical rates less relevant. If this is the case, we must rely on the first factor to justify a rank or alter what would otherwise be the rank based on historical information.

- **Political Feasibility** applies to sources, like general fund expenditures or taxes, that require approval by an elected body, such as a city council, or a group of voters or property holders. For multi-jurisdictional projects, we also consider any obstacles in coordination. Political feasibility depends on whose approval is required (elected body, voters or affected property owners), what percentage of support is required for approval, the potential perceived value of the project to the relevant approvers, the amount that will have to be paid and competing demands for resources. Greater feasibility will be associated with situations where representatives as opposed to voters can approve, where required approval percentages are lower, where those benefiting most directly from the project are being assessed, where avoided costs are higher and where the amount they are being asked to pay is lower. Preference is given to sources with less political complexity, and thus, high political feasibility. For the analysis done in this report, we simplified the political feasibility ranking by making it a function of approval requirements, with a low ranking corresponding to a ¾ vote requirement, medium a majority vote requirement, and high requiring no popular or property holder vote, only action by the legislative body.

- **Amount** refers to how significant the amounts granted per project or potentially generated from a particular tax, assessment or fee are relative to the total cost for the project, or the relevant project phase, e.g. planning. Grant programs typically provide information about the minimum or maximum grants available, and it is often possible to see what typical grants sizes have been in the past, although this can change. It is possible to estimate the particular amount of revenue generated from a potential tax, assessment or fee, based on certain assumptions, such as the number of people or property in the relevant area and how they are going to be assessed. A high rating denotes that the source
covers a more substantial amount of the total project cost relative to an medium source. The 1-3 scale is again utilized for Amount. The measure used for ranking was percentage of project phase cost covered by the source, with a high rating if the source covered 40% or more of the phase cost, a medium for 25% - 40%, and a low for less than 25%.

6.2 Other Criteria

Our final category is set of other factors that are selectively, not universally, important to the viability of a source for any project. We did not create formal quantitative rankings for this category, but instead would utilize these considerations qualitatively as a means of adjusting the overall rating.

- **Administrative Feasibility** refers to the complexity involved in the initial application or legislative/voter approval process as well as upon the disbursement of funds. This includes but is not limited to factors such as the time and resources required to apply and any required reporting or evaluation upon the disbursement of funds. Preference is given to programs with the least administrative complexity, and thus high administrative feasibility.

- **Equity Considerations** are applicable to grants that prioritize benefits to underserved communities, typically in the form a prioritizing them for funding or allowing for a reduced matching requirement. A high rating indicates that the funding option has an equity-related preference or targeting that matches up with a project has a substantial equity component.

- **Timing** refers to a) how soon the funds could be available, with preference given to programs with a short turnaround time (within one year) and b) how soon the funds must be used, with preference to programs with flexible guidelines.

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9 A note on incentive effects: There are also two types of incentive effects that project sponsors may want to consider in choice of funding/financing source. Some funding mechanisms may influence the cost of locating in an at risk area; for example, when a benefit assessment to the immediate neighborhood is used to finance a levee. Also, the taxes or fee providing the funding can impact incentives for work and investments, referred to as “deadweight loss” in economics. Different types of taxes and fee will produce different degrees of deadweight loss.

10 A note on Equity Considerations: Equity issues as related to the distributional impact of different funding choices are particularly important considerations. Distributional impacts are represented both by a disconnect between those who pay and those who benefit from a project as well as vertical distribution issues due to locational clustering of households with similar socioeconomic status, creating an issue of how to fund projects in lower-income communities. While we recognize that further details of equity considerations are important to include when rating the desirability of a funding source for a project, we also recognize that these considerations are highly project specific. We encourage project planners to include these additional impacts when looking at Equity Considerations in order to select the sources that would provide the most equitable financial impact across households.
Figure 2 summarizes our evaluation criteria and ranking categories for our four core criteria and our other categories.

**Figure 2: Evaluation Criteria and Ranking Categories**

<table>
<thead>
<tr>
<th>Eligibility</th>
<th>Likelihood of Funding</th>
<th>Political Feasibility</th>
<th>Amount</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Likely</td>
<td>High - 3</td>
<td>High - 3</td>
<td>High - 3  &gt; 40% of cost</td>
<td>Administrative Feasibility</td>
</tr>
<tr>
<td></td>
<td>&gt; 50% chosen</td>
<td>No vote</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Likely</td>
<td>Medium - 2</td>
<td>Medium - 2</td>
<td>Medium - 2             25% - 40% of cost</td>
<td>Equity Considerations</td>
</tr>
<tr>
<td></td>
<td>21% - 49% chosen</td>
<td>50% vote</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td>Low - 1</td>
<td>Low - 1</td>
<td>Low - 1                &lt; 25% of cost</td>
<td>Timing</td>
</tr>
<tr>
<td></td>
<td>&lt; 20% chosen</td>
<td>⅔ vote required</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6.3 Overall Ranking
We created the overall rating by averaging the value of the Likelihood of Funding or Political Feasibility ranking with the Amount ranking. We assigned a “Low” to sources averaging less than 1.99, a “Medium” for sources ranging between 2.0 and 2.49, and a “High” for sources between 2.5 and 3.0. These rankings were confirmed after considering any factors within the “Other” category.

7. Rating Funding/Financing Sources for Three Prototype Project
Given the large number of different project types for sea level rise protection and stormwater management, it was not feasible for our team to apply our evaluation framework to all project types. In order to illustrate how project planners could apply our evaluation methodology to prioritize funding and financing sources, we chose three prototype projects that we felt best reflected the different types of projects that the County might pursue. We chose a Horizontal Levee and a Wetland Restoration project for sea level rise, and Green Streets for extreme rainfall. We then applied the ratings framework to all of our funding/financing options in relation to the three project phases--planning, implementation, and operations & maintenance--for each of these project types. After seeing how we apply the criteria to these examples, project planners
interested in other project types should be able to take the raw descriptive information in our Funding Compendium, which maps directly into our criteria, and prioritize the different funding/financing sources for their projects.

### 7.1 Selecting Prototype Projects

From our client conversations, general project research and interviews with San Mateo County project leads, we've identified these three projects as the most useful to include in this analysis. For both sea level rise and extreme rainfall, we first started by researching past projects in the region and paid close attention to key aspects of the project descriptions such as costs, jurisdictions, co-benefits, and funding/financing sources.

With Sea Level Rise, we compiled a list of past protection projects in the region:

- Flood Walls (San Francisquito Creek Project)
- **Horizontal Levees** (Oro Loma in East Bay, elements of SAFER BAY)
- Levees (Foster City, North Bayfront Levee, South Bayfront Levee)
- Sea Gates (San Bruno)
- Seawalls (Miranda Road)
- **Wetlands Restoration** (South Bay Salt Ponds)

We ultimately chose horizontal levees and wetlands restoration. We found levee structures to be the most common protection mechanism in our research. In contrast to a traditional levee that just holds water back with a barrier, horizontal levees use layers of natural flood protection to provide a wave dampening effect. They can be designed lower than a traditional levee and can therefore be less intrusive and be built in low-lying areas. Several project leads we interviewed currently see horizontal levees as the most advanced and suitable levee structure where conditions are suitable, and many projects that that the county has been involved with, such as the San Francisquito Creek, are considering building them. Additionally, horizontal levees are more cost effective than traditional levees and have significant co-benefits relating to biodiversity.

In addition to protective structures, several past and current projects in the County have also focused on wetland restoration. The key benefit to pursuing this approach is that in addition to blocking tides action, wetlands offer a wealth of co-benefits ranging from community recreational opportunities to habitat conservation, all of which are popular areas of interest among the funders we researched.

For Extreme Rainfall, we started by researching past diversion and infiltration projects.
Diversion
- Storm drains (storm sewers) and underground storm sewer pipe system
- Engineered channels (Bayfront Canal)
- Natural waterway enhancement or engineering (Pescadero Integrated Flood Control, prospective Belmont Creek project)

Infiltration
- **Green Streets** (San Mateo, Redwood City)
- Onsite stormwater capture/Low Impact Development
- Regional stormwater capture and infiltration projects (Orange Memorial Park)

We decided to focus on infiltration projects, given that infiltration projects are known to be more cost effective and have more environmental co-benefits. Within infiltration, we chose Green Streets. Typical gray stormwater infrastructure is designed to simply move stormwater away from an environment, while green streets treat stormwater at its source and deliver additional environmental, social and economic benefits. Green streets are currently not as highly adopted in the County as the other model projects we will discuss, but have been mentioned as a technology of interest by several interviewees. In cities like Philadelphia, where green infrastructure is widely adopted, local communities tend to be very invested in doing their part, which gives projects a substantial advantage for funding programs that prioritize civic engagement and support.

Specific details about each model project will be found in the next section, along with our top recommendations for funding sources for the three stages of each project (planning, implementation, and operations & maintenance).

### 7.2 Prototype Project Descriptions

**A. Project Type 1: Green Street**

- **Description:** Green Streets are one type of green infrastructure, which is a stormwater management approach to slow, filter and cleanse stormwater runoff from impervious surfaces like streets and sidewalks. Unlike typical streets (also known as gray infrastructure), green streets capture rainwater at its source instead of directing stormwater to sewer systems.
- **Cost:** $1.5M Total - 2000 feet length by 12 feet width

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11 Qualitative descriptions formulated with information from the following source: https://www.epa.gov/G3/learn-about-green-streets
12 Estimate based on past green streets planning documents published by City/County Association of Governments in San Mateo County
• Planning: $200,000
• Implementation: $1,000,000
• Operations & Maintenance: $300,000

- **Co-benefits**: providing flood risk mitigation, community enhancement, increased property values, and other multiple benefits.

- **Political Factors**: Typically in one jurisdiction with high buy in from local community

- **Past Projects** - both received 600k + funding from CA Prop 1 (voted in 2014, $200M for matching grants to public agencies and nonprofits for multibenefit stormwater initiatives
  
  - Redwood City ($1.2M): rain gardens along streets and intersections
    - Rain gardens are shallow, vegetated basins that collect and absorb runoff from rooftops, sidewalks, and streets. This practice mimics natural hydrology by infiltrating, and evaporating and transpiring stormwater runoff
  
  - San Mateo County ($1.2M): curb extensions on streets, intersections and a parking lot
    - Curb extensions are a type of rain garden meant specifically for long, narrow spaces such as the space between sidewalks and curbs

**B. Project Type 2: Horizontal Levee**

- **Description**: Rather than using a traditional vertical wall to prevent increasing water levels and stop the flow of water this model incorporates a physical levee that, instead of dropping down sharply on the Bay side, slopes gently downwards in the same way that the Bay Area did naturally years ago while incorporating vegetation and wetlands to break the waves. This structure is setback from the coast and includes a wide expanse of natural habitat, often a coastal marsh, in-between the wall and the water. The marshes provide a natural buffering capacity to reduce impacts of coastal flooding, storm surge, and wave action, leading to a shorter levee that is less expensive than its traditional counterpart. In addition, the sedimentation process causes the slope to rise as sea level rises. A horizontal levee also increases water quality while providing a sustainable environmental habitat on the edge of the Bay.

- **Cost**:
  - The estimated horizontal levee costs is $6M/mile for 50 years, comprised of ~$4M for the levee itself and ~$2M for the wetland restoration component. This

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13 The Operation and Maintenance cost numbers are lifetime costs, so that the cost in any one year would be a fraction of this amount. Also, these amounts are not discounted for the time value of money. We acknowledge that, in actuality, cost estimates for the operations & maintenance phase of projects should be discounted over time. Because this phase could last up to many decades, future costs should be discounted to their present value.

cost includes planning, implementation, and operations & maintenance expenses over fifty years.

- With about 50 miles of coastline for San Mateo County this project can be expected to cost up to $300M over a 50 year period, which includes other expenses besides implementation. There are many segments where a horizontal levee would not be suitable. We chose to make the implementation cost $50M for illustrative purposes, assuming a several mile long segment, as this is a substantially higher amount than any of our other projects and will require large funding/financing options.

- To compare, traditional levees cost about $12M/mile for 50 years.

- As an estimate for the three phases, it would look similar to this rationing:
  - Planning: $5,000,000
  - Implementation: $50,000,000
  - Operations & Maintenance: $10,000,000

- **Co-benefits:**
  - Significant environmental benefits across large geographic areas. These levees allow for the continued provision of habitat associated with marshes and other coastal habitats, which is the home to a wealth of fish, shellfish, and bird species.
  - Opportunities for outdoor recreation activities. Many horizontal levees include bike and/or walking paths that provide coastal access to surrounding citizens.
  - Improved water quality. The wetlands component of the horizontal levee allows for harmful nutrients to be removed from wastewater through the plants and other green life that inhabits it.

- **Jurisdiction:**
  - These projects tend to be multi-jurisdictional, because they stretch across multiple cities along the bay.

- **Past Projects:**
  - Point Loma ($7M): A two-acre wetland basin that can both remove nutrients from wastewater and provide extra wet weather storage capacity.
    - East Bay Sanitary District is funding because of wastewater treatment co-benefit.
    - Projects partners included Ora Loma and the Castro Valley Sanitary District
    - Collaborated with the San Francisco Estuary Partnership to get funding through the Integrated Regional Water Management Program

- SAFER Bay (San Francisquito Creek) (estimated $104M cost): group plans to include living levees that would extend from northern boundary of Menlo Park to
southern boundary of Palo Alto.

C. Project Type 3: Wetlands Restoration15

- **Description:** Wetland restoration refers to the rehabilitation of a degraded wetland or the restoration of a wetland that has been destroyed. Wetland restoration can include enhancing an existing wetland and its surrounding ecosystem to facilitate specific functions which include, but are not limited to: sea level rise mitigation, preservation/protection of aquatic resources, restoration of ecological integrity and restoration of natural function.

- **Cost Estimate:** $3.5M Total16
  - Note: Cost is highly dependent upon whether or not a levee is included as part of the restoration, and the condition and size of the wetlands being restored. Levee-inclusive projects are, naturally, much more expensive (upwards of $1M).
    - Planning: $200,000
    - Implementation: $3,000,000
    - Operations and Maintenance: $300,000

- **Co-benefits:**
  - Increased Habitat Connectivity
    - Vegetation restoration
    - Wildlife restoration
  - Fishery revitalization
  - Recreational Benefits
    - Water-way utilization
      - Kayaking
      - Fishing
  - Increased water quality
  - Erosion Mitigation
  - Stormwater Flooding Protection
  - Levee Construction

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15 Qualitative descriptions formulated with information from the following sources:
https://www.epa.gov/wetlands/wetlands-restoration-definitions-and-distinctions
https://www.epa.gov/wetlands/principles-wetland-restoration

16 Estimate based upon actual project costs as reported by:
• Past Projects:17
  o San Francisquito Creek Stabilization at Bonde Weir (SMC) - $285,900
    ■ This project removed Bonde Weir, a significant fish migration barrier in San Francisquito Creek, and constructed a new channel design to improve fish migration, stabilize the channel and reduce erosion. The new channel restores access to 40 upstream miles of steelhead spawning and rearing habitat.
    ■ No levee construction
  o South Bay Salt Ponds Construction at Mountain View Ponds (SMC) - $1,677,683
    ■ Restore 690 acres of tidal wetlands and create 20 acres of upland habitat in the Mountain View Complex of the South Bay Salt Pond (SBSP) Restoration Project
    ■ Includes levee construction
  o Sears Point Tidal Marsh Phase I & II (Sonoma) - $5,241,941
    ■ Prepare site for levee breaching in Phase II ($3.7M)
      ● Includes levee construction
    ■ Restore tidal action to 960 acres and provide connectivity of tidal marsh habitat from the Sonoma Baylands to San Pablo Bay ($1.5M)
      ● Includes levee construction

7.4 Prototype Project Ratings
In Appendix B we include matrices with evaluations of funding sources for three stages of each of our projects - planning, implementation, and operations & maintenance. Each of these nine matrices shows how preferred funding sources are evaluated using our aforementioned ranking methodology. In most cases we only display sources that are rated high or medium, as the point of the analysis is to help focus on programs that have a relatively higher potential relative to other options.

There are exceptions where we include a “Low” rated source if we believe that the program may have potential in the future. For example, for horizontal levee, we list the San Francisco Bay Restoration Authority, even though the overall rating is a “Low”. This is because the Low rating is due to maximum grant size being only 20% of cost. However, in the future, we believe that the parcel tax that funds SFBRA could be increased (further described in our Recommendations section).

Some of our insights from this exercise will be detailed in our Recommendations section.

17 Project details available:
8. Funding/Financing Innovations

Our research uncovered a handful of ideas for completely new approaches to paying for resilience-based infrastructure. These options are in early stages of development, and are generally not at the point where they can be used to fund projects. Moreover, some of the ideas, such as a tax on property-casualty insurance premiums to fund climate adaptation, require authorization at the state (or federal) level. However, two of these sources could be explored by SMC as possible long-term funding sources.

**Issue Catastrophe Bonds with a ‘Resilience’ Component:**¹⁸ Municipalities often issue catastrophe bonds, which act as insurance against a potential natural disaster. A growing body of research suggests that these catastrophe bonds should be issued with a ‘resilience component,’ that is, alongside an additional infrastructure project targeting climate resilience. More specifically, when the local jurisdiction purchases the catastrophe bond to protect against flooding or some other natural disaster, they suggest an additional resilience-related project, like a traditional levee to protect against the flooding. Assuming that building the infrastructure project lowers the risk to investors of the natural disaster, the issuer can lower the coupon it pays out to investors for the original catastrophe bond issuance and use that extra “savings” as a rebate with which to build the levee. This incentivizes building resilience-based infrastructure projects alongside catastrophe bond issuances, which are relatively widespread.

The major limitation of this source is its early stage of development; no “resilience bond” project has been completed. As a result, investor appetite and the extent of project risk is unclear. Further assessments of administrative and political feasibility are also necessary.

**Monetize Flood Insurance Premiums:**¹⁹ To receive a federally regulated or insured mortgage, homeowners residing in high flood-risk areas are required to have flood insurance. FEMA is in the process of reclassifying substantial areas of SMC’s bayside territory as highly vulnerable flood areas, which in turn will require more property owners to pay for insurance. However, estimates show that only one-third to one-half of homeowners that are mandated to own insurance actually have it. Currently, FEMA through its National Flood Insurance Program is the main provider of this insurance. Changing how flood insurance is provided, including how premiums are calculated, could both incentivize more consumers to purchase insurance and generate funds for sea level rise mitigation and stormwater management projects.

FEMA-sponsored flood insurance plans charge about $4 in premiums for every $1,000 of total insured value. However, analysis has shown that in high-risk flood areas (0-100 year timeframe)

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¹⁸ Re:Focus Partners, Leveraging Catastrophe Bonds, 2015
¹⁹ ‘Finance Guide for Resilient by Design’ by the Bay Area by Design Finance Team, 2017
in SMC, the true actuarial rate should only be about $2.50 for every $1,000 of assets insured. Accordingly, local entities could, in theory, establish a JPA or GHAD to act as the intermediary between homeowners and insurance companies and charge lower premiums than the FEMA-sponsored plans. For example, the JPA or GHAD could charge homeowners $3.50 per $1,000 of assets insured and, and use the margin above the cost of the risk (in this case, $3.50 - $2.50 = $1 per $1,000 of assets insured) to fund a climate change adaptation project that would further reduce flood risk.

There are several benefits associated with monetizing flood insurance premiums, with the largest being revenue creation for new projects; estimates show that SMC could generate around $2M per year through this method with the current level of insured homeowners. This revenue could be applied immediately as a medium-sized funding source, or used to take out a bond to finance large project costs. Additionally, more homeowners would be inclined to buy flood insurance because premiums would be cheaper than FEMA-sponsored insurance plans, and insurance premiums could continue to decrease as more flood risk mitigation plans are executed.

While there is considerable upside to this source, there are also several obstacles to its implementation. First, political and regulatory challenges arise both in creating JPAs and GHADs to act as intermediaries, and in obtaining FEMA approval of these new flood insurance policies. This is a relatively new concept, and accurate, high quality data/projections are needed to convince both FEMA and insurance providers that the actuarial numbers work out. Additionally, logistical details, such as pricing, implementation, and length of insurance contracts still need to be determined; this is likely still several years from becoming a feasible option.

9. Final Recommendations
To conclude our research, we provide two sets of recommendations - one for project planners, and one for policymakers.

Our recommendations and lessons for project planners reflect what we have learned from reviewing the funding of many different projects and the characteristics and behavior of many different funding/financing sources.

9.3 For Project Planners
1. A project sponsor will usually have to package together a number of different sources to successfully complete a project. Different project phases typically require different sources. Moreover, most grant sources will only fund up to a moderate dollar limit and require matching funds.
2. Grant sources strongly favor green and multi-benefit projects and if you want to maximize your chances for grant funding, design such a project.

3. In California at least, state and regional programs are a much better candidate for providing grant funding than federal sources, even though most of these programs rely on periodic ballot propositions--like CA Prop 1 or Bay Area Measure AA--to fund them. Partly this relative suitability is based on their sole focus on California combined with significant dollars. Also state and regional sources appear to prioritize issues that are more relevant to local communities in their grantmaking when compared to federal sources.

4. Grant dollars tend to be more focused on the implementation phase, with less available for project planning and virtually nothing for operations & maintenance. Many of the so-called planning grants are not for project planning but more general area plans, such as the local Hazard Mitigation Plan, Integrated Water Resource Management Plan or Stormwater Resource plan process. This means that the project feasibility stage most frequently will be internally funded. Projects in the County and its cities have historically pulled from their General Funds for a substantial portion of their planning expenses.

5. While there are many competing demands on the General Fund and new general revenues typically require voter approval, the General Fund has played a role in most successful climate adaptation projects and will continue to do so for the foreseeable future. The General Fund is especially useful in the planning phase of projects, and also in funding the operations & maintenance phase. For projects that are too small to justify going for balloted taxes and bond financing but too large to be paid for by grants, the General Fund also can be critical in funding the implementation phase. Moreover, even grants require significant local matches. Some cities in the County earmark a particular General Fund revenue source, such as the utility users tax or transient occupancy tax, to fund capital projects including those addressing sea level change and storm water management.

6. While typical sources are by definition the most predictable, be opportunistic and creative, as in many instances atypical sources come into play. Examples in terms of corporate contributions include Facebook and the SAFER Bay project, SFO’s support for vulnerability assessment planning in its region, or Novartis’ funding of Belmont Creek (where it has a facility) dredging and planning. Two large regional stormwater capture and infiltration projects--Orange Memorial Park and Holbrook-Palmer Park--have obtained investments from CALTRANS, which is using those projects to help offset the stormwater runoff reduction obligations for its highways. While we do not rate foundations as a very promising funding source for any of the project types, several years ago the South Bay Salt Ponds project was able to get a large commitment from a group of local foundations for property acquisition.

7. Local funding sources that require balloted approval, as is the case with taxes and most fees, cannot be justified in terms of required time, effort and administrative cost if
intended to fund a single, moderate-sized project, such as a Green Streets one. However, such an effort can be justified in terms of enabling a flow of funds or bond to pay for a larger set of such projects. Where we have rated balloted sources as appropriate for a moderate-sized project, we are assuming that the recommended funding/financing source would be developed in the context of creating a larger pool of money to fund multiple projects. Thus, it often makes sense to be thinking in terms of funding sources for a set of projects as opposed to a single project.

9.3 For Policy Makers
While we did not attempt to quantify the aggregate gap between the demand for project funding and available relevant grant and dedicated funding sources, it is significant and we found a widespread noting of the need for additional, dedicated funding. We make the following recommendations in terms of addressing this gap.

1. If it is upheld by the courts, SB 231 will enable counties and cities to introduce a stormwater fee without the 50% property owner vote currently required. A number of cities around the state, including Burlingame and Palo Alto in our area, already have stormwater fees, supported by property owner votes. If instituted in SMC’s unincorporated areas and cities, a stormwater fee on the level of Palo Alto’ at $13.65 per month per average residence would provide on the order of $54 million per year for operations & maintenance and $70 million per year for capital spending. This could be an extremely accessible and promising source of funding for stormwater-related projects, and policymakers should seriously consider pursuing stormwater fees.

2. For multi-benefit projects directly adjoining the Bay, such as wetlands restoration and horizontal levees, the new San Francisco Bay Restoration Authority is a promising funding source compared to others we evaluated. However, the SFBRA has published a list of 129 already existing, theoretically eligible projects needing well over a billion dollars in funding, and it will only be providing a total of $25 million a year to between 5 and 10 projects. The SFBRA parcel tax is a relatively modest $12 per year, and it should be a targeted for increase in the coming years.

3. Paying for larger projects typically involves some balloted source, so it is critical for policy makers and leaders to educate voters on potential co-benefits and cost avoidances of projects. Projects that receive significant community approval are those that clearly outline co-benefits (benefits in addition to providing climate resilience) and cost avoidances (outlining how a specific project would save homeowners from, for example, heavy traffic or flooding).\textsuperscript{20} While SMC residents understand that climate change is occurring, they need to be more informed about the coming impacts on their communities.

\textsuperscript{20} ‘Finance Guide for Resilient by Design’ by the Bay Area by Design Finance Team, 2017
and how prudent investments can minimize these costs.

10. Acknowledgements
Our team certainly was not alone during the course of this project, and there are a great number of people and institutions we would like to recognize for lending us assistance along the way. First and foremost, we would like to sincerely thank our instructor, Professor Larry Litvak, for his extensive guidance and counseling this quarter. Professor Litvak was always available to provide feedback, answer questions, and clarify our project tasks, and the quality of our work is significantly higher as a result of his dedication to our cause.

Additionally, we would like to thank all of the SMC personnel, including the Office of Sustainability folks, project leads, and subject matter experts, for their time and help. We interviewed several SMC employees as we were conducting background research, and we could not have properly completed our project without their insights and suggestions. In particular, we would like to warmly thank Jasneet Sharma, who was our main point of contact within the SMC Office of Sustainability. Our team frequently communicated with Jasneet to discuss project goals and expectations, and having a clearly defined objective helped us to produce high quality content.

Finally, we would like to thank the Stanford University Public Policy Department for affording us this opportunity, and for providing us with the academic skills necessary to complete a project like this one. Our entire team feels that we grew both as policy analysts and as professionals this quarter, and we will all utilize the skills and lessons we learned from this project in our lives beyond Stanford.
11. Appendices

Appendix A: Actual Project Descriptions

The county requested that we create a menu of recommended funding sources for two of their current projects - the Pescadero Integrated Flood Management Project and Plan Princeton. This section of our Appendix contains the descriptions for these two projects, and the specific funding matrices with recommended sources can be found in Appendix B.

A. Pescadero Integrated Flood Management Project

- **Description:** There is an extreme problem with the Pescadero Creek Road where even a simple rain can cause the streets to flood. San Mateo County, with the support of all its residents, has noted this issue as a priority resource management concern. They have identified their own criteria in determining their ideal project types in that they:
  - 1. Benefit fish and wildlife
  - 2. Protect public health, safety, and property

During a 2014 Solutions to Flooding report\(^2\) the County recommended four areas to focus on for comprehensive and integrated solutions:

- Control Upland sediment Sources
- Restore sediment floor plans and fallout
- Improve flow under the road by dredging (Removing sediment from the bottom of a body of water)
- Restore an open channel in the marsh

They have a few different scenarios and suggestions for the project and most all of them include dredging Butano Creek, which would prevent the flooding of the creek by increasing its depth and allow more water to flow naturally without flooding. There are many different variations to the dredge with some along the channel and others running parallel and through it. They all require dredging multiple times but the actual act itself has a less significant cost than the construction and the implementation of dredging within the area. Due to the nature of the project and the impact of the wildlife, the funding and financing options similar to wetlands restoration might fit best here since they both would have the same criteria and the same goals in mind.

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\(^2\) Solutions to Flooding on Pescadero Creek Road, http://sanmateoord.org/PescaderoFlood/Pescadero%20Rd_Butano_Flood_Solutions_Final%20Report%202014.pdf
• **Cost:** They estimate the entire restoration process to be about $2.6M. This includes restoration, direct and indirect costs, payroll, and supplies. They have applied for a NOAA Coastal Resilience Grant that could fund about $1.5 million of the project.\(^{22}\)

• **Co-benefits:** Re-establish access to 10 miles of habitat for steelhead and coho. Improve the public safety and economic conditions for the Pescadero community.

**Jurisdiction:** No issues with multiple jurisdictions since it is a smaller location. There is complete support from the entire county and all who could be affected by this issue.

• **Past Projects:**
  - In 2016 they were able to restore over 100 acres of floor plan to Butano Creek
  - In March of 2017 they applied for the NOAA Coastal Resilience Grant in hopes to restore 8,000 feet of the Butano Creek Channel, reduce the risk of flooding, and restore access to over 10 miles for endangered species including salmon and trout.

**B. Plan Princeton Shoreline Management**

• **Description:** Plan Princeton is a study being undertaken by San Mateo County to update the land use strategy for the unincorporated area of Princeton. Currently, the plan is in the drafting stage, with review and certification to follow. The most recent document released, *The Preferred Plan and Policy Framework\(^{23}\)*, outlines a preferred plan and a policy framework for each of the project’s areas of focus. For the purposes of our funding analysis, we focus on the two most relevant goals to our project: Coastal Access and Shoreline Management as well as Conservation.

• **Selected Areas of Focus:**
  - **Coastal Access and Shoreline Management:** This aspect aims to minimize the effects of coastal hazards, including shoreline erosion, flooding, and sea level rise via natural processes, and limit the use of engineered structures when possible. Additionally, the shoreline stabilization and management tactics employed should not adversely affect biological/marine resources or inhibit public access. While San Mateo County has not yet finalized which sea level rise mitigation technique it will use through Plan Princeton, it has several potential options, including horizontal levees and green streets, to consider.
  - **Conservation:** The Preferred Plan will incorporate protection and restoration measures for natural resources, and manage public access. It will also include policies to preserve agriculture.

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• **Cost:** Official costs have not yet been assigned, but based off similar projects in San Mateo County, we will focus on funding sources of $1 million or above.

• **Co-benefits:** In addition to these two areas of focus, the report covers Land Use and Community Design, Circulation and Streetscape, and Parks and Recreation.

• **Jurisdiction:** San Mateo County
Appendix B: Prototypical and Actual Project Rating Matrices

This is a link to our comprehensive ratings matrices, in which we assign ratings to various payment sources that we believe to be feasible options for prototypical and actual projects being pursued.
Appendix C: Funding Compendium

This is our comprehensive list and information of all sources that we researched.
Appendix D: Past Projects in SMC

We compiled a list of 21 past and ongoing projects in the county to help inform our evaluation criteria and recommendations.
Appendix E: Interviewees

1. Summer Burlison, Project Manager on the County Planning Department
   a. Princeton Shoreline Management Plan
2. Erika Powell, County Flood and Resilience Manager
   a. Bayfront Canal and Atherton Chanel Flood Management and Restoration Project
   b. Colma Creek Navigable Slough
   c. Belmont Creek Watershed Management Plan
3. Justin Lovell, Public Works Administrator
   a. South San Francisco Stormwater Capture Projects at Orange Memorial Park
4. Deborah Hirst, Legislative Aide to Supervisor Horsley
   a. Pescadero Integrated Flood Reduction Project
5. Kathleen Schaeffer
   a. Private Flood Insurance Funding Sources
6. Susanne Moser, Consultant
   a. Funding/Financing Sources of interest for SMC
7. Len Materman, Executive Director, San Francisquito Creek JPA
   a. SAFER Bay projects, private funding sources
8. Matthew Fabry, C/CAG
   a. Funding stormwater management projects